

**What is Claimed:**

1. A shock indicator, comprising:
  - (A) A base having a first side and a second side;
  - (B) an indicator associated with the first side of the base, the indicator comprising a plurality of indicator subparts, the subparts comprising solid material arranged (i) in a first configuration when the shock indicator is in a first state prior to a shock event, and (ii) in a second configuration when the shock indicator is in a second state following a shock event; and
  - (C) means associated with the second side of the base for attachment of the shock indicator to a surface.
2. The shock indicator of claim 1 wherein the subparts of the indicator comprise material selected from the group consisting of toner powder particles, talc, flour, pigment, clay, ceramics, alumina, metals, and combinations of the foregoing.
3. The shock indicator of claim 2 wherein the subparts are surface modified.
4. The shock indicator of claim 2 wherein the subparts comprise a first size and the indicator further comprises another component comprising a second subpart larger than the first subpart.
5. The shock indicator of claim 1 further comprising a containment member disposed on the first side of the base and enclosing the indicator therein, the containment member being transparent, thereby facilitating the visual determination of the indicator in either its first or second configuration.
6. The shock indicator of claim 5 further comprising an impingement object within the containment member and positioned to impact the indicator during a shock event to aid in transitioning the indicator from the first state to the second state, the impingement object

selected from the group consisting of glass beads, plastic beads, ceramic beads, ball bearings and combination thereof.

7. The shock indicator of claim 1 wherein the indicator comprises dry materials and the shock indicator further comprises means to indicate exposure to wetness.
8. The shock indicator of claim 1 wherein the base is a film, the base further comprising a differentiating component on the first side, the differentiating component comprising a film material to enhance the visual contrast between the differentiating component and the indicator.
9. The shock indicator of claim 1 wherein the indicator comprises an agglomerated powder in the first state prior to a shock event and a dispersed powder in the second state following a shock event, the indicator subparts comprising particles of the powder.
10. The shock indicator of claim 1 wherein the indicator and the first side of the base comprise different colors to provide a visual contrast therebetween.
11. The shock indicator of claim 1 wherein the indicator comprises a solid and a liquid.
12. The shock indicator of claim 11 wherein the solid comprises a clay and the liquid is mineral oil.
13. The shock indicator of claim 11 wherein the solid is selected from the group consisting of exfoliated organophilic clay fillers, silica particles, glass particles, inorganic pigments, and combinations of the foregoing and the liquid at 23°C has a surface tension within the range from about  $10 \times 10^{-3}$  N/m to about  $80 \times 10^{-3}$  N/m, a density from about 0.5 to about 2 grams/cm<sup>3</sup>, and a zero rate shear viscosity from about  $1 \times 10^{-3}$  to about  $1 \times 10^6$  Pa-s.

14. The shock indicator of claim 13 wherein the fluid comprises a liquid selected from the group consisting of silicone fluids and oils, saturated hydrocarbon-based oils, silicone gums, mineral oil, glycerols, water and combinations of the foregoing.
15. The shock indicator of claim 11 further comprising a differentiating component associated with the first side of the base, the differentiating component comprising a first side and a second side and an annulus extending through the differentiating component from the first side to the second side, the indicator positioned within the annulus, at least one of the first side or the second side of the differentiating component comprising a structured surface.
16. The shock indicator of claim 15 wherein the structured surface comprises a microstructured surface, the microstructured surface associated with the first side of the base and defining a plurality of channels arranged in a predetermined pattern, the channels comprising an opening to permit the ingress of fluid when the indicator is in a second state.
17. The shock indicator of claim 16 wherein the microstructured surface comprises a regular array of precise structures having a shape selected from the group consisting of symmetrical shapes and asymmetrical shapes.
18. The shock indicator of claim 1 wherein the means for attachment is selected from the group consisting of adhesives and mechanical fasteners.
19. The shock indicator of claim 1 wherein the means for attachment comprises a material that reduces, maintains or increases the shock force transmitted to the indicator during a shock event
20. The shock indicator of claim 1, further comprising a transmission layer positioned on the first side of the base between the base and the indicator, the transmission layer

comprising a material to reduce, maintain or increase shock force transmitted to the indicator during a shock event.

21. The shock indicator of claim 20, wherein the transmission layer comprises a material capable of changing the threshold at which the indicator experiences a shock event.
22. The shock indicator of claim 20, wherein the transmission layer comprises a viscoelastic material having a storage modulus of at least about 1.0 psi ( $6.9 \times 10^3$  Pascals) and a loss factor of at least about 0.01 at the temperature and frequency at which the shock indicator is used.
23. The shock indicator of claim 22, wherein the viscoelastic material is selected from the group consisting of urethane rubbers, silicone rubbers, nitrile rubbers, butyl rubbers, acrylic rubbers, fluorine-based elastomers, fluorine-based rubbers, styrene-butadiene rubbers, and combinations of the foregoing.
24. The shock indicator of claim 20, wherein the transmission layer comprises a material selected from the group consisting of acrylates, epoxy-acrylates, silicones, cyanate esters, polyesters, polyurethanes, polyamides, ethylene-vinyl acetate copolymers, polyvinyl butyral, polyvinyl butyral- polyvinyl acetate copolymers, epoxy-acrylate interpenetrating networks and combinations of the foregoing.
25. The shock indicator of claim 20, wherein the transmission layer comprises a thermoplastic material selected from the group consisting of polyacrylates, polycarbonates, polyetherimides, polyesters, polysulfones, polystyrenes, acrylonitrile-butadiene-styrene block copolymers, polypropylenes, acetal polymers, polyamides, polyvinyl chlorides, polyethylenes, polyurethanes, and combinations of the foregoing.
26. The shock indicator of claim 20, wherein the transmission layer comprises a thermosetting resin.

27. The shock indicator of claim 1 further comprising a plurality of indicators associated with the first side of the base, each indicator comprising a plurality of indicator subparts, the subparts comprising solid material arranged (i) in a first configuration prior to a shock event, and (ii) in a second configuration following a shock event.
28. The shock indicator of claim 27 wherein each of the plurality of indicators is constructed to transition from the first state to the second state at shock events of different severity.
29. The shock indicator of claim 1 further comprising:
  - A containment member disposed on the first side of the base and enclosing the indicator therein, the containment member being transparent, thereby facilitating the visual determination of the indicator in either its first or second configuration; and
  - An impingement object disposed within the containment member that allows the impingement member to impact the indicator during a shock event.
30. The shock indicator of claim 29 wherein the containment member further comprises surface structures.
31. The shock indicator of claim 1 wherein the subparts of the indicator further comprise a primary subpart of a first average size and secondary subparts of a second average size, the second average size being less than the first average size, the secondary subparts agglomerated around one or more primary subparts to form the indicator.
32. The shock indicator of claim 31 wherein the primary subpart is associated with the base so that the primary subpart will dislodge from the base upon the occurrence of a shock event.

33. The shock indicator of claim 1 wherein the indicator is positioned within the shock indicator so that a shock event from any direction will impart substantially the same shearing, compression, tension, cleavage and/or peel forces into the indicator.
34. The shock indicator of claim 33 wherein the indicator is positioned within the shock indicator using more than one attachment point.
35. The shock indicator of claim 1 further comprising a containment member disposed on the first side of the base and enclosing the indicator therein and wherein single or multiple masses are associated with the interior and/or exterior surfaces of the containment member to further modify the response of the shock indicator to a shock event.
36. The shock indicator of claim 1 wherein the indicator comprises a viscous liquid with one or more shear plane surfaces within the liquid.
37. An assembly comprising the shock indicator of claim 1 associated with an electronic device selected from the group consisting of cellular telephone, personal digital assistant, hand held computers and digital cameras.
38. A method for the manufacture of a shock indicator, comprising:
  - (A) providing a base comprising a first surface and a second surface, the second surface of the base associated with an attachment means; and
  - (B) placing an indicator in association with the first surface of the base, the indicator comprising a plurality of indicator subparts, the subparts comprising solid material arranged (i) in a first configuration when the shock indicator is in a first state prior to a shock event, and (ii) in a second configuration when the shock indicator is in a second state following a shock event.
39. The method of claim 38 further comprising placing a containment member over the first side of the base and over the indicator, the containment member being transparent,

thereby facilitating the visual determination of whether the indicator is in the first configuration or the second configuration.

40. The method of claim 38 wherein placing an indicator in association with the first surface of the base comprises depositing a slurry in association with the first side and thereafter drying the slurry to provide the indicator in the first configuration.
41. The method of claim 38 further comprising: providing a differentiating component associated with the first side of the base the differentiating component comprising a first side and a second side and an annulus extending through the differentiating component from the first side to the second side, one of the first side or the second side comprising a structured surface; and placing an indicator in association with the first surface of the base further comprises placing the indicator within the annulus.
42. The method of claim 41 wherein the structured surface comprises a microstructured surface associated with the first side of the base, the microstructured surface comprising a regular array of precise structures having a shape selected from the group consisting of symmetrical shapes and asymmetrical shapes, the precise structures defining a plurality of channels arranged in a predetermined pattern, the channels comprising an opening to permit the ingress of fluid within the channels when the indicator is in a second state.
43. The method of claim 38, further comprising providing a means for attaching the indicator to another surface.
44. The method of claim 38, further comprising providing a transmission layer in association with the first side of the base between the base and the indicator, the transmission layer comprising a material to reduce, maintain or increase shock force transmitted to the indicator during a shock event.
45. The method of claim 38 wherein placing an indicator in association with the first surface of the base further comprises placing a plurality of indicators in association with the first

side of the base, each indicator comprising a plurality of indicator subparts, the subparts comprising solid material arranged (i) in a first configuration prior to a shock event, and (ii) in a second configuration following a shock event.

46. The method of claim 38 further comprising associating an electronic device with the shock indicator, the device selected from the group consisting of cellular telephone, personal digital assistant, hand held computer and digital camera.
47. The method of claim 38 wherein placing an indicator in association with the first surface of the base is accomplished by screen printing the indicator onto the first surface.
48. The method of claim 38 wherein the shock indicator is provided in a first condition to transition from a first state to a second state at a first shock force; and further treating the shock indicator to a second condition such that after the further treatment, the shock indicator will transition from a first state to a second state at a second shock force.